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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|------------------------|---------------------|------------------|
| 09/786,290 | 03/01/2001 | Chao-Shih Joseph Huang | PHN-17,526 | 8112 |

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

[REDACTED] EXAMINER

SMITS, TALIVALDIS IVARS

| ART UNIT | PAPER NUMBER |
|----------|--------------|
| 2654 | |

DATE MAILED: 06/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

| | |
|-------------------------------------------|-----------------------------------------------|
| Application No. 09/786,290 | Applicant(s) Chao-Shih Joseph Huang |
| Examiner Talivaldis Ivars Smits | Art Unit 2654 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on _____.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-11 is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-11 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892) 4) Interview Summary (PTO-413) Paper No(s). _____

2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) Notice of Informal Patent Application (PTO-152)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s). 1 6) Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

2. The examiner did not find a Form PTO-1449 accompanying the three International Search Report references submitted by applicant (Bahl *et al.*, Rahim, and Guan *et al.*), as well as the Abstract of the untranslated Markus Falkhausen *et al.* (DE 43 25 404) accompanying them. However, the examiner has considered these references, and will sign Form-1449 therefor once a copy thereof is received from applicant.

Specification

3. The Abstract of the disclosure is objected to because the referenced drawing element numbers are not enclosed in parentheses. Correction is required. See MPEP § 608.01(b).

4. The Title of the invention is not sufficiently descriptive. A new title is required that is more clearly indicative of the novelty in the invention to which the claims are directed.

5. The disclosure is objected to because:

- it lacks the section headings, such as: Field of the Invention, Background of the Invention, Brief Summary of the Invention, Brief Description of the Drawings, and Detailed Description of the Invention;
- it refers to claims by number (on page 3);
- it uses “symmetrically” for the intended --symmetrical-- (on page 13, line 14).

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-3 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Lalit Rai Bahl *et al.* (EP 0 788 090, published August 6, 1997).

Bahl *et al.* teach:

- receiving a degraded speech input signal (speech corrupted by noise, Abstract);
- estimating a signal condition (automatically identify the signal's environmental class, Abstract with col. 3, lines 33-34 and 54-55);

- selecting a processing model from a predetermined model set corresponding to the estimated signal condition (environmental class) and processing with said model to output a result corresponding to the most likely uttered speech signal (“each class is transcribed by a system that is made specifically for it”, Abstract).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 4-6 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bahl *et al.* as applied to claims 1-3 and 7-9, above, and further in view of Vikram Krishnamurthy *et al.* (“On-Line Estimation of Hidden Markov Model Parameters Based on the Kullback-Leibler Information Measure”, IEEE Trans. SP, August 1993).

As per claims 4, 5, and 10, Bahl *et al.* do not teach iterative (on-line) signal condition estimation and signal estimation based on a processing model estimated therefrom, nor using a divergence-based discriminant function for adaptive learning of the model parameters. However, Krishnamurthy *et al.* teach using the Kullback-Leibler divergence (information measure) for on-

line learning of Hidden Markov Model (HMM) parameters (Title, first paragraph of Introduction, p. 2557). Therefore, for the HMM taught by Bahl *et al.* (col. 4, line 53-54), it would have been obvious for an artisan at the time of invention to do iterative stochastic matching using this divergence, taught by Krishnamurthy *et al.*, because the latter teach that their approach yields “accurate estimates of the HMM parameters, including transition probabilities, Markov state levels, and noise statistics” (first paragraph of Introduction, p. 2557).

And, of course, following standard practice, an artisan at the time of invention would have known to terminate this on-line estimation process if a processing result no longer improves.

As per claim 6, Bahl *et al.* teach a plurality of signal environments (“several environments”, col. 3, line 37). Therefore, it would have been obvious for an artisan at the time of invention to include a selectable environment having a more degraded signal condition, so as to cover the various possibilities.

As per claim 11, neither Bahl *et al.* nor Krishnamurthy *et al.* teach using a *relative* divergence. However, it would have been obvious for an artisan at the time of invention to make the divergence symmetrical (*i.e.*, make it “relative”) to make its properties more intuitively-appealing (since intuitively “distance” functions are symmetrical in the two variables whose relative distance is being computed).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

David Erik Chevalier *et al.* (U.S. Patent 6,275,800, filed February 23, 1999), Alex Waibel *et al.* (U.S. Patent 6,324,510, filed November 6, 1998), and Roland Kuhn *et al.* (U.S. Patent 6,327,565, filed April 30, 1998)) teach adapting the speech model to different noise environments.

Yifan Gong (U.S. Patent 6,389,393, filed April 15, 1999), Qi Li *et al.* (IEEE Robotics and Automation, March 1999), Anath Sankar (IEEE Trans. SAP, May 1996), Lionel Delphin-Poulat *et al.* (IEEE ICASSP 98, May 1998), and Eiichi Tsuboka (IEEE ICASSP 94, April 1994) teach stochastic matching, the latter two using the Kullback-Leibler divergence.

11. **Any response to this action should be mailed to:**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
(non-fee Amendments should be directed to: Mail Stop Non-Fee)

or FAXed to:

(703) 872-9314 (please label *formal* communications
“OFFICIAL”; please label *informal* or draft communications,
“PROPOSED” or “DRAFT”)

Hand-delivered responses should be brought to Crystal Park 2, 2121 Crystal Drive,
Arlington, VA, Sixth Floor (Receptionist).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner, Talivaldis Ivars Smits, whose telephone number is (703) 306-

13.3011. The examiner can normally be reached Mondays-Fridays from 8:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold, can be reached on (703) 305-4379. The facsimile phone number for Technology Center 2600 is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center 2600 customer service, whose telephone number is (703) 306-0377.



TALIVALDIS IVARS SMITS
PRIMARY EXAMINER

Art Unit 2654
June 20, 2003